

REMARKS

Amendments

The claims are amended to recite language in accordance with conventional US practice. In addition, claims 2 and 3 are amended to replace the expression “reagent too little.” See page 2, lines 7-9.

Preferences recited in claims 9 and 10 have been cancelled and are now recited in new claims 11-12. Claims 13-14 are directed to further aspects of the invention. See, e.g. the original claims.

Rejection Under 35 USC §112, second paragraph

While applicants’ disagree that “characterized by the fact that” renders the claim indefinite, the claims are amended to delete this phrase and to use language in accordance with conventional US practice. Withdrawal of the rejection is respectfully requested.

Rejection Under 35 USC §103

Claims 1-10 are rejected as allegedly being obvious in view of GB 416,407 or Chan (US 4,517,132). This rejection is respectfully traversed.

Firstly, clarification is requested as to whether the rejection is based on the disclosures of GB ‘007 and Chan taken individually and in the alternative, or whether the rejection is based on the combination of the two disclosures. At page 4 of the Office Action it is stated that the references are “each taken alone.” But, page 7 of the Office Action refers to the “selective combination of G.B. ‘007 and U.S. ‘132.” Clarification is requested.

GB ‘007 discloses a process for preparing aliphatic cyanhydrins and their subsequent use in manufacturing unsaturated nitriles such as methacrylonitrile. In the process for making the aliphatic cyanhydrins an aliphatic ketone is boiled in the presence of a base and hydrocyanic acid.

The only specific example of aliphatic ketone disclosed by GB ‘007 is acetone, and thus the only specific of aliphatic cyanhydrin disclosed is acetonecyanhydrin. In terms of bases, GB ‘007 list the following: alcoholic caustic soda, aqueous caustic soda, gaseous ammonia, aqueous ammonia, pyridine, piperidine, quinoline, primary, secondary or tertiary

amines, potassium cyanide and sodium cyanide. See page 3, lines 2-20.

GB '007 also discloses that the use of strong bases such as caustic soda or piperidine, results in equilibrium being reached almost immediately, whereas when using a weaker base such as pyridine, the reactants are boiled for a half an hour. GB '007 discloses that organic bases such as pyridine are preferred because side reactions are minimized. In Example I and II, the bases used are, respectfully, piperidine and pyridine. The initial reactants in both examples are acetone and hydrocyanic acid. It is noted that the examples of employ large amounts of base. Example I uses 30 parts by volume of piperidine for 600 parts by volume of acetone. Example II uses 20 parts by weight of pyridine for 493 parts by weight of acetone. Compare applicants' Example 2 wherein 160 ppm of diethylamine is used for 400 ml of methyl ethyl ketone.

Chan (US '312) disclose a process for preparing cyanohydrins by reacting certain carbonyl compounds in a solution of metallic cyanide and hydrochloric acid. The reaction occurs in the presence of a solvent. This reaction provides for the in situ generation of hydrogen cyanide. See column 2, lines 14-54.

The carbonyl ketones used in the process are of the formula $\text{CO}(\text{R}^1)(\text{R}^2)$, wherein R^1 and R^2 are individually hydrogen, alkyl, haloalkyl, alkoxyalkyl, aryl, alkylaryl, haloaryl or alkoxyaryl. The following are disclosed as example of preferred carbonyl compounds: formaldehyde, acetaldehyde, propionaldehyde, isobutyraldehyde, chloroacetaldehyde, N-caproaldehyde, acetone, methyl ethyl ketone, methyl isobutyl ketone, chloroacetone, and hexanone-3.

Water is said to be the most preferred solvent because it is inexpensive and because most of the reactants are said to be soluble therein. Other solvents that are said to be preferred are: methanol, ethanol, isopropanol, methylene chloride, toluene, mixtures thereof, and aqueous mixtures of the solvent systems. With regards to the metallic cyanide, Chan states that potassium cyanide, sodium cyanide and calcium cyanide are preferred.

In Chan's Examples, the carbonyl compounds used are isobutyraldehyde (Examples I and V), anhydrous acetone (Example II), methyl ethyl ketone (Example III), and n-butyraldehyde (Example IV). In all the Examples, water is used as the solvent. Sodium cyanide is used in Examples I-IV and potassium cyanide is used in Example V. The amounts of cyanide used are quite large relative to the amount of carbonyl compound involved. Roughly equal molar amounts in Examples I-IV and in Example V 31.8 pounds of

potassium cyanide are used for 35.2 pounds of isobutyraldehyde. Again, compare applicants' Example 2 wherein 160 ppm of diethylamine is used for 400 ml of methyl ethyl ketone.

Neither GB '007 nor Chan ever mention or suggest the use of diethyleneamine as a base catalyst for a reaction between methyl ethyl ketone and hydrocyanic acid. In the Chan process the cyanide compound is not characterized as a "base" or as a catalyst, but as a reactant for the in situ generation of the reactant hydrogen cyanide. Thus, clearly there is no suggestion to modify the process of Chan so as to use a base like diethylamine in place of the cyanide compound as this would eliminate the formation of the necessary reactant hydrogen cyanide.

As for GB '007, it is clear that this reference, while broadly disclosing the use of bases, provides no suggestion of the secondary amine diethylamine. The base that GB '007 disclose are alcoholic caustic soda, aqueous caustic soda, gaseous ammonia, aqueous ammonia, pyridine, piperidine, quinoline, primary, secondary or tertiary amines, potassium cyanide and sodium cyanide. Thus, GB '007 merely discloses secondary amines broadly. The only specific examples of amines given are pyridine, piperidine, and quinoline, of which are cyclic bases. Nothing within the disclosure of either GB '007 or Chan provides any hint, suggestion or motivation to select diethylamine as the base for use in the process of GB '007.

Compare, for example, *In re Jones*, 21 USPQ2d 1941 (Fed. Cir. 1992), which also dealt with selection of a specific amine from a broad generic disclosure. Specifically, the invention in *Jones* was a specific amine salt of dicamba, the 2-(2'-aminoethoxy)ethanol salt. The prior art generically disclosed amine salts of dicamba, but did not disclosed the claimed the 2-(2'-aminoethoxy)ethanol salt. The Court characterized the claimed amine salt as a primary acyclic amine with an ether linkage. Next, the Court compared the structure of the claimed amine salt with the specific amine salts disclosed by the prior art. The diethanolamino salt was said to be a secondary amine without an ether linkage. The morpholino salt, while having an ether linkage, was noted to be cyclic. Finally, the isopropylamino salt was said to be a primary amine but with a structure that was "quite different." Based on this analysis, the Court held that the prior art did not suggest the claimed salt.

Looking at the bases disclosed by GB '007, it is evident that none of these structures suggest diethylamine. For example, pyridine, piperidine, and quinoline are all cyclic, whereas diethylamine is clearly acyclic. Moreover, nothing within the disclosure of GB '007, or

Chan for that matter, suggests that diethylamine would exhibit the level of catalyst activity demonstrated in applicants' Example 2. In this example, 160 ppm of diethylamine is used for 400 ml of methyl ethyl ketone. Conversely, the amount of base used in the examples in GB '007 and the amount of cyanide compounds used in the examples of Chan are appreciably higher.

In view of the above re4marks, it is respectfully submitted that neither GB '007 nor Chan, taken alone or in combination, render obvious applicants' claimed invention. Withdrawal of the rejection is respectfully requested.

Respectfully submitted,



Brian P. Heaney, Reg. No. 32,542
Attorney for Applicants
MILLEN, WHITE, ZELANO & BRANIGAN, P.C.
Arlington Courthouse Plaza 1
2200 Clarendon Boulevard, Suite 1400
Arlington, VA 22201
Direct Dial: 703-812-5308
Facsimile: 703-243-6410
Email: heaney@mwzb.com

Filed: July 3, 2003